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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/630,934

07/31/2003

So Suzuki

KAN 154

1233

23995

7590

04/06/2005

RABIN & Berdo, PC  
1101 14TH STREET, NW  
SUITE 500  
WASHINGTON, DC 20005

EXAMINER

TOLEDO, FERNANDO L

ART UNIT

PAPER NUMBER

2823

DATE MAILED: 04/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/630,934	SUZUKI, SO	
	Examiner	Art Unit	
	Fernando L. Toledo	2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 June 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3,7-12 and 16-20 is/are pending in the application.
- 4a) Of the above claim(s) 12 and 16-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 7-11 is/are rejected.
- 7) ☒ Claim(s) 3 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                    | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date. _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 and 7 – 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu.

In re claim 1, Wu, in the U. S. patent 6,239,007 B1; figures 1A – 1F and related text, discloses forming first polysilicon 102 serving as a gate on a semiconductor substrate 100; forming a first insulating film 104 on the semiconductor substrate to cover the first polysilicon to be thicker than the first polysilicon and to leave a difference in height around said first polysilicon (Figure 1A); forming a second insulating film 106 on a whole surface of the first insulating film to have such a thickness to flatten a difference in height near said first polysilicon (Column 3, Lines 3 – 13); selectively etching the second insulating film by an etchback method until the first insulating film located on an upper surface of the gate is exposed (Column 3, Lines 5 – 10; Figure 1B); selectively etching the first insulating film located on the upper surface of the gate until the upper surface of the gate is exposed (Figure 1C); burying a space in which the first insulating film is etched, and forming a second polysilicon 108 on the second insulating film (Figure 1D); etching the second polysilicon, exposing the second insulating film, and leaving the second polysilicon in the space (Figure 1E); etching the second insulating film (Figure 1F); etching the first insulating film (Figure 1F); forming high melting point metal 110 covering the

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second polysilicon; siliciding the second polysilicon by a heat treatment (Column 3, Lines 35 – 50); and removing an unreacted portion of the high melting point metal (Figure 1F).

Wu does not clearly disclose wherein the first insulating film is formed to be thicker than the first polysilicon.

It would have been obvious to one having ordinary skill in the art at the time the invention was made wherein the first insulating film is formed to be thicker than the first polysilicon, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. Note that the specification contains no disclosure of either the critical nature of the claimed thickness or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen thickness or upon another variable recited in a claim, the Applicant must show that the chosen thickness is critical. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990). In addition, the selection of insulating layer thickness, is obvious because it is a matter of determining optimum process conditions by routine experimentation with a limited number of species of result effective variables. These claims are prima facie obvious without showing that the claimed ranges achieve unexpected results relative to the prior art range. *In re Woodruff*, 16 USPQ2d 1935, 1937 (Fed. Cir. 1990). See also *In re Huang*, 40 USPQ2d 1685, 1688 (Fed. Cir. 1996)(claimed ranges or a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art). See also *In re Boesch*, 205 USPQ 215 (CCPA) (discovery of optimum value of result effective variable in known process is ordinarily within skill or art) and

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In re Aller, 105 USPQ 233 (CCPA 1995) (selection of optimum ranges within prior art general conditions is obvious).

3. In re claim 7, Wu discloses wherein a condition for etching the first insulating film is that the second insulating film is hardly etched (Column 3, Lines 5 – 10).

4. In re claim 8, Wu discloses wherein the second polysilicon is formed to have such a thickness as to flatten a difference in height near the space (Figure 1E).

5. In re claim 9, Wu discloses wherein the second polysilicon is undoped polysilicon (Column 3, Lines 20 – 25).

6. In re claim 10, Wu discloses wherein a dry etching method is used for etching (Column 3, Lines 15 – 20).

7. In re claim 11, Wu discloses wherein the high melting point metal is one of titanium and cobalt (Column 3, Lines 45 – 50).

### ***Claim Objections***

8. Claim 3 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter:

Wu substantially discloses the claimed invention, except thinning the first insulating layer by etching the entire surface of the insulating film. Wu teaches forming a conformal layer that is thinner at some points (farther from the gate) and thicker at other points (closer to the gate) than

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the polysilicon film. There is no need for Wu to dry etch the entire insulating film and it would take improper hindsight to modify Wu to teach the disclosed limitation.

### ***Response to Arguments***

10. Applicant's arguments filed 8 February 2005 have been fully considered but they are not persuasive for the following reasons.

11. Regarding Applicant's arguments that the limitations of claim 4 are not taught or are not an obvious variation of the invention of Wu. Examiner respectfully submits that the dielectric layer would be thicker than the polysilicon layer at the sides of the polysilicon layer, the claim does not specify that the insulating film has to be thicker than the polysilicon layer throughout the whole surface of the wafer.

12. Therefore the U.S.C. §103(a) rejection stands and it is considered proper.

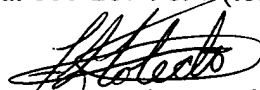
### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fernando L. Toledo whose telephone number is 571-272-1867. The examiner can normally be reached on Mon-Thu 7am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 571-272-1855. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Fernando L. Toledo  
Examiner  
Art Unit 2823

flt

1 April 2005